

AMENDMENTS TO THE CLAIMS

Following is a complete listing of the pending claims.

1. (Currently amended) A pulser circuit for generating an electrical pulse of short duration for use in an atom probe, comprising:

- (a) a circuit comprising at least a first node;
- (b) a voltage supply for charging the first node, the voltage supply being configured to provide outputs at different voltages, the voltage of the outputs being selectable;
- (b) a switching network having a first switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node, and an RC network having a time constant of less than 33 microseconds, comprising at least one resistor connected between the first node and the voltage supply, ~~and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the node;~~ and
- (d) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse; and
- (e) a shaping network configured to provide pulses with different voltage amplitudes at different pulse frequencies, the pulse voltage amplitudes and pulse frequencies being selectable.

2. (Currently amended) The pulser circuit of claim 1 wherein the further comprising a controllable shaping network is configured to provide pulses with different pulse shapes, the pulse shapes being selectable for providing pulses of selectable amplitudes and shapes.

3. (Currently amended) The pulser circuit of claim 1 further comprising at least one switching network connected in series with the RC network.

4. (Original) The pulser circuit of claim 1 further comprising a shunting network for shunting transients to a low impedance node.

5. (Currently amended) ~~A pulser circuit for generating an electrical pulse of short duration for use in an atom probe system,~~ comprising:

- (a) an atom probe with a micro-channel plate and an analysis aperture.
- (b) a specimen positioned proximate to the analysis aperture;
- (ac) a circuit comprising at least a first node positioned to create at least a portion of a voltage potential between the specimen and the analysis aperture;
- (bd) a voltage supply for charging the first node, the voltage supply being configured to provide outputs at different voltages, the voltage of the outputs being selectable;
- (ee) a switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node, wherein the switch includes at least one of a transistor and a diode;
- (df) ~~an controllable RC network, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the node, for generating pulses having selectable amplitudes and shapes; and~~
- (eg) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse to increase the voltage potential between the specimen and the analysis aperture.

6. (Currently amended) ~~A pulser circuit for generating an electrical pulse of short duration for use in an atom probe system,~~ comprising:

- (a) an atom probe with a micro-channel plate and an analysis aperture,
- (b) a specimen positioned proximate to the analysis aperture;
- (ac) a circuit comprising at least a first node positioned to create at least a portion of a voltage potential between the specimen and the analysis aperture;
- (bd) a voltage supply for charging the first node, the voltage supply being configured to provide outputs at different voltages, the voltage of the outputs being selectable;
- (ee) a first-switch operable between a conductive state for shorting the first node to a grounded node and a nonconductive state for opening the circuit between the first node and the grounded node;
- (df) an RC network, comprising at least one resistor connected between the first node and the voltage supply, and wherein the capacitance is a combination of the switch capacitance and at least one capacitor connected to the node;
- ~~(e) at least one or more second switching networks connected in series;~~
- (fg) wherein the switch is in a nonconductive state to charge the RC network and the switch is in a conductive state to discharge the RC network, thereby generating the electrical pulse to increase the voltage potential between the specimen and the analysis aperture; and
- (h) a shaping network configured to provide pulses with different voltage amplitudes at different pulse frequencies, the pulse voltage amplitudes and pulse frequencies being selectable.

7. (New) The circuit of claim 1 wherein the pulse frequency is selectable between 10 KHz and 1 MHz.

8. (New) The circuit of claim 1 wherein the pulse voltage amplitude is between 60 and 3000 volts.

9. (New) The system of claim 5, further comprising a blocking diode operatively coupled to the circuit.
10. (New) The system of claim 5, further comprising a termination network operably coupled to the circuit.
11. (New) The system of claim 5 wherein the switch includes a MOSFET.
12. (New) The system of claim 5 wherein the switch includes a first switch, and wherein the system further comprises at least one second switch stacked on the first switch, wherein the at least one second switch includes at least one of a transistor and a diode.
13. (New) The system of claim 5, wherein the RC network has a time constant of less than 33 microseconds.
14. (New) The system of claim 6 wherein the switch includes a first switch and wherein the system further comprises at least one or more second switching networks connected in series.
15. (New) The system of claim 6, wherein the RC network has a time constant of less than 33 microseconds.
16. (New) The system of claim 6 wherein the pulse frequency is selectable between 10 KHz and 1 MHz.
17. (New) The system of claim 6 wherein the switch includes a MOSFET, wherein the RC network has a time constant of less than 33 microseconds, wherein the

pulse frequency is selectable between 10 KHz and 1 MHz, and wherein the system further comprises:

- a blocking diode operably coupled to the circuit; and
- a termination network coupled to the circuit.

18. (New) The system of claim 6 wherein the switch includes at least one of a transistor and a diode.

19. (New) The system of claim 6 wherein the pulse voltage amplitude is between 60 and 3000 volts.